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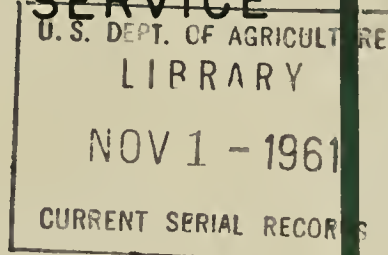
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# TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION  
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

No. 612

The Forest-Land Gully in the Driftless Area--  
Natural or Man-Caused?<sup>1/</sup>



In the Driftless Area of southwestern Wisconsin, southeastern Minnesota, and northeastern Iowa, forest-land gullies are an all-too-common blight on the landscape (fig. 1). They can be seen at almost any turn of the road on the steep, wooded slopes of this unglaciated region. Where they break out of the woods onto cleared land at the foot of the slope they often terminate in alluvial deposits of rocks and boulders. Locally these are known as rock or limestone runs. They are a frequent cause of major damages to agricultural land and to roads, bridges, and stream systems following heavy rains.

To understand the problem one must first be able to picture the land. It is a dissected peneplain made up of flat-topped ridges, steeply sloping hillsides, and narrow valley floors. Ridgetops as well as lower slopes and bottom lands are farmed. Forests normally occupy only the steeper land in between.

This unique land-use pattern suggests that the forest-land gully could be caused by runoff from upland fields. Extensive travel and observation in the area lend support to this idea. Walk up any forest-land gully and you will find a field. A 1936 forest survey report states: ". . . in 80 square miles that we have covered to date on this survey we have not found a single instance of erosion through forest except where it has been caused by open fields on the ridgetop."<sup>2/</sup>

Natural or man-caused? In seeking further evidence it was reasoned that if the gullies were caused only by runoff from fields, then forested slopes that did not lie below fields should have no gullies. Most ridgetops were cleared for farming long ago, but here and there one was considered too narrow to be farmed, so it was left in timber. By examining air photos we located a number of such timbered ridges in the La Crosse, Wis., area.

Forty completely forested watersheds were spotted on the air photos, and then examined on the ground to check for gullies or other signs of surface flow. Not a single gully or eroded channel was found. Where a natural channel did exist it invariably faded away at the base of the slope, disappearing under the ancient alluvium of the valley floor. It often ended in a cultivated field, and there was no indication that water from the wooded slopes had ever discharged onto the field (fig. 2).

Further support to the man-caused theory is given by an early experiment near La Crosse which showed that forest land yielded little overland flow, even under severe runoff conditions.<sup>3/</sup>

Although neither our recent study nor the earlier ones cited positively prove that gully erosion was not a feature of the natural landscape, the combined evidence strongly supports this conclusion.

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Richard S. Sartz, Research Forester

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1/ The Station's research in the Driftless Area is conducted by the La Crosse, Wis., field unit in cooperation with the Wisconsin Conservation Department.

2/ Lake States Forest Experiment Station. Unpublished report. 1936.

3/ Hays, O. E., Mc Call, A. G., and Bell, F. G. Investigations in erosion control and the reclamation of eroded land at the Upper Mississippi Valley Soil Conservation Experiment Station near La Crosse, Wis., 1933-43. U.S. Dept. Agr. Tech. Bul 973, 87 pp., illus. 1949.





Figure 1.--Gully through forested slope of the Driftless Area.



Figure 2.--Outlet of 53-acre wooded watershed blends into alluvial fill of the valley. An artificial channel had to be dug to install a runoff measuring instrument on this watershed.